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East Europe Report

SCIENTIFIC AFFAIRS
No. 687

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CONTENTS

POLAND

POLISH-HUNGARIAN RELATIONS IN COMPUTER TECHNOLOGY

Budapest SZAMITASTECHNIKA in Hungarian Jul-Aug 80 p 18

[Text] The Polish-Hungarian relations in computer technology have a background of more than a decade. The appearance of the second-generation CEMA's in Hungary may be considered the beginning of the cooperation. But it was the ESR program that resulted in a more significant progress. Of the Polish tasks in the ESR, the R30 class, medium-capacity computer--developed jointly with the USSR--may be pointed out as an equipment which is continually available to domestic users from socialist imports. True, the Soviet Union also exports this class, but the Polish-made R32 models, the so-called "complete automatized control systems connected to institutions," which solve concrete and individual problems on the users, cannot be substituted by anything else in the domestic plans of use.

Most of the periferials needed to make the systems complete are developed and manufactured by the Poles themselves and are only partly dependent on the products of other socialist countries. The change to magnetic tape and soft disc technology that followed the punch card technology, for instance, was successful. The mosaics presser is also noteworthy which is outstanding in its class alongside with the line presser which is comparable in price and performance to mid-size computers but has a higher output. The development and manufacture of displays has also reached a level adequate for meeting demand. According to the newest informations, the manufacture of a high-capacity (100 MBytes and larger) magnetic disc storage is also being planned.

The list would not be complete without mentioning the array of long-distance data processing equipment and systems, which were designed on the basis of the FDR's communications industry and which are mass produced today. The Polish partner demonstrated to Hungarian specialists in February 1980 how the "TELE-JS" subsystem operates, which consists of a central unit of 1-MByte operative memory (ES 2032), a local display system (ES 7190), a 16-channel long-distance data processor with a 48-KByte operative memory (ES 83 7101), start/stop terminals (ES 8575), and a synchronized terminal system containing groups and individual displays. Our partner achieved significant results in developing the RJAD-2 long-distance data processing system. In essence, they mass produce models belonging to every speed category. In addition, they also manufacture press terminals on the basis of a SAAB license, and video terminals on the basis of a LOGABAX license. Among the socialist countries, it is primarily the Polish industry which manufactures long-distance data processors.

Similarly to its partners, the FDR began developing in the manufacture of MSZ equipment a structure which is close to its profile already existing in the ESZ and which, together with the developments of the SZ II and III--also built on the existing structure--we are not going to describe in detail now.

The reader is familiar with the development and product structure of the Hungarian ESZ and MSZ computer technology. In comparing that with the Polish computer technological profile outlined above, it is apparent that both countries have a similar task in the multilateral cooperation. A closer scrutiny will also reveal significant differences between our computer technological equipment, such as, for example, the performance, use and specifications of our ESZ computers or our line presser placed between the peripherials or our fixed disc between the storages, and in some cases even the production technologies are significantly different. Both the similarities and differences in our countries' existing computer technological production profiles have possibilities for further cooperation, development, cooperation in production, and specialization.

It is also known that scientific and technical product and production activity, the preparation, implementation and control of barter, the finding of possibilities for specialization and cooperation etc. are included in the main tasks of bilateral cooperation between our ministries and the similar ministries of other socialist countries.

Aside from the tasks and requirements of multilateral international cooperation, the domestic industrial developmental goals and possibilities, and the attempt to reach the goals determined earlier by the Computer Technological Central Developmental Program determine the character of computer technological cooperation in a given relation.

As an example, let us look at some concrete industrial developmental goals and let us examine them from the aspect of the Polish-Hungarian cooperation: it is the domestic industry's task to play an increasing role in meeting the demands of the domestic users.

In cooperating with the FDR, this means that

--the domestic user's demand for selection can be better met (e.g., R-32 computer, up-to-date system of data collecting and data preparation, AIR and long-distance data processing AIR's),

--the improvement of the technical quality of the product structure is suitable for re-establishing the balance in barter,

--our products included in the cooperation are suitable for import compensation,

--the improvement of our production can be realized through a better use of our existing capacities.

The existing capacities and the existing product structure may be the bases of cooperation or labor division and specialization. Such is, for example, the display the development and production of which has been manufactured in both countries for a long time in economical quantities, and probably will continue to be manufactured in the near and more distant future.

As a result of the actually existing objective possibilities and limitations of cooperation, we have achieved significant results in the past 10 years. Our annual trade in computer technology exceeds 12 million rubles. Part of the trade reaches the consumers directly, but a significant part consists, indirectly, of the peripherials necessary for completing our systems (mosaics presser, e.g., DZM 180) and of partial units (keyboard RE 0101), i.e., they can be considered as actual parts of the industrial cooperation.

In the branch of Polish-Hungarian computer technology, an agreement was made to make preparations for a longer-term bilateral computer technological pact which will be signed by industrial and foreign trade enterprises. From the Hungarian side, the persons authorized to make preparations and to sign are, under the responsibility of the City Council BT [expansion unknown], the BUDAVOX and the METRIMPEX; from the Polish side it is the MERA Association.

In the coming years we will increase the mutually advantageous trade in computer technology and will improve the composition of products that serve as barter. In the complete system, we will take great care to engage and systematize each other's subsystems and partial units, thereby also trying to find possibilities for the expansion of specialization and cooperation.

9414
CSO: 2502

BRIEFS

GIANT LATHES FOR USSR--Czechoslovakia will deliver two SUT 205 D lathes to the Soviet shipbuilding industry in the beginning of the Seventh Five-Year Plan [1981-85]. The contract worth about Kcs 80 million was signed between CSSR's STROJIMPORT and USSR's STANKOIMPORT enterprises. The lathes produced by the SKODA enterprise in Plzen have a turning diameter of 2,050 mm and a 50-meter long lathe bed. [Prague MLADA FRONTA in Czech 22 Oct 80 p 7]

CSO: 2402

DEVELOPMENT OF MICROELECTRONICS OUTLINED

Statement by First Deputy Minister

Sofia RADIO TELEVIZIYA ELEKTRONIKA in Bulgarian No 6, 1980 pp 2, 3

[Article by Engr P. Kis'ov, First Deputy Minister of Electronics and Electrical Engineering: "The Accelerated Development of Microelectronics--A Strategic Area in the National Economy"]

[Text] The 11th BCP Congress, the National Party Conference and the Plenum of the BCP Central Committee concerned with the accelerated development of certain strategic areas in scientific and technical progress in Bulgaria have outlined the ways and means for sharply improving the quality and efficiency of the economy. A significant share in carrying out this strategic task has been allotted to the introduction of electronics in the national economy and social life by the broad introduction of the top achievements in electronics and microelectronics.

The Party Central Committee, the Politburo and Comrade Todor Zhivkov personally have always devoted great attention to the development of our microelectronics industry, as a strategic subsector of the national economy. In his speech before the National Conference of 31 October 1979, Comrade Zhivkov ranked the accelerated development of microelectronics as one of the prime tasks for the intellectualization of social production during the Eighth Five-Year Plan.

The collectives involved in the development and production of semiconductor devices and integrated circuits are beginning to carry out this strategic directive with full mobilization and an increased feeling of responsibility. The scientific, production and technological potential are grouped in several basic areas.

In the area of MOS technology, efforts have been focused primarily on the permanent and working memories (static and dynamic), specialized MOS circuits, universal logical circuits, calculator circuits, and the SM 600 microprocessor family.

Static working memories with a capacity of 1K and a family of 4K dynamic working memories are the input into mass production. A family of dynamic working memories with a capacity of 16K, 64K and so forth are to be developed. During the Eighth Five-Year Plan the increase in the production of working memories will be over 3-fold. The degree of integration will rise by many-fold and in parallel with this the functional complexity of the produced memories will rise.

Microprocessor circuits will be rapidly developed, with the organizing of mass production for 8- and 16-digit microprocessor sets. The production of microprocessor sets in the Eighth Five-Year Plan will rise by many-fold. The development of a single-chip microcomputer will be realized.

Bipolar technology will be developed as the second most important area in our microelectronics. The basic efforts will be focused on the development and production of interface circuits, and later also large bipolar circuits and analog circuits for industrial use. During the following five-year plan their production will grow significantly.

Hybrid integrated circuits will be developed as an independent area in microelectronics. Basic efforts will be focused on the development of thin-layer hybrid circuits for radiotelephony, digital-to-analog and analog-to-digital converters and so forth. A significant portion of the hybrid circuits planned for production will be used in industrial-end articles. During the Eighth Five-Year Plan the growth of hybrid circuits is to be around 3-fold, with a sharp increase in their functional capabilities, and this will fully satisfy the domestic needs of the nation.

Greater attention is also being paid to the traditional discrete semiconductor devices chiefly in two aspects: improving the quality, output and reliability of the range of silicon planar epitaxial devices produced in Bulgaria and broadening the range of low- and medium-power transistors, and the development of a new area, that of high-powered silicon planar epitaxial transistors.

Activities are to be increased in the area of optical electronic devices (light diodes, light displays, phototransistors, optrons, and so forth). The main efforts are focused on optrons with improved basic performance, namely: the K current transfer constant and speed.

The planned development of the individual areas of integrated circuits and discrete semiconductor devices will cover a significant portion of the nation's requirements by local production, and will allow us to carry out reciprocal exchange in this area with the CEMA member countries, and particularly with the USSR. On the basis of the developed microelectronic elements, production will be organized for such important microcomputer systems as the data processing microcomputer system, the IZOT 0250, the device for preparing data for a floppy magnetic disc, the IZOT 8500 digital terminal, the IZOT 7925 video terminal, the IZOT 8531-01 dialog terminal, the IZOT 1002S test processor, the IZOT 1001S pass system, and others.

The high production growth, the qualitative changes in the functional capabilities of the basic product groups and the tasks of technical progress will be achieved by introducing new production capacity, by expanding and reconstructing the existing, as well as by partial new construction.

However the carrying out of the National Comprehensive Program for the introduction of electronics in the national economy and social life depends most upon living human potential operating directly in this area, upon its technical skills, its political and labor activeness.

The experience acquired during the last 15 years and the repeatedly shown high capabilities of the collectives at the Botevgrad Scientific-Production Combine for Semiconductor Equipment are a good guarantee for the success of this noble and highly patriotic undertaking.

Statement by Plant Manager

Sofia RADIO TELEVIZIYA ELEKTRONIKA in Bulgarian No 6, 1980 pp 3, 4

[Article by Engr Marin Marinov, Director-in-Chief of the Botevgrad Scientific-Production Economic Combine for Semiconductor Equipment: "Semiconductor Equipment--The Basis for the Introduction of Electronics into the National Economy and Social Life"]

[Text] After the historic April Plenum, the BCP Central Committee has constantly devoted attention and taken enormous care for the development of semiconductor microelectronics, as one of the most important subsectors and agent of technical progress in the national economy. Due to this and because of the fraternal help of the Soviet Union, our nation is rapidly developing a modern electronics and electrical engineering industry, and this is having a growing impact on improving the structure and raising the efficiency of the national economy.

The 11th BCP Congress posed responsible tasks for the semiconductor industry in implementing the strategic motto for high quality and high efficiency. For carrying out these tasks, under the leadership of Comrade Todor Zhivkov, a national comprehensive program has been worked out for the introduction of electronics in the national economy and social life. This program has been approved by the Politburo of the BCP Central Committee and the Council of Ministers.

The National Party Conference and the plenum of the BCP Central Committee for the accelerated development of certain strategic areas of scientific and technical progress confronted the sector with new, more responsible tasks in the area of raising the technical and economic level and realizing the top achievements in certain areas of electronics and electrical engineering.

For carrying out the party decisions, there have been a thorough analysis and implementation of the ideas concerning the development of semiconductor equipment in our country. The chief positions have been clarified for the development of the scientific-technical and production potential of semiconductor microelectronics. These are:

1) A substantial improvement in the quality and economic effectiveness of the traditionally produced semiconductor devices and integrated circuits;

2) A greater reliability of the produced discrete semiconductor devices and integrated circuits;

3) Developing qualitatively new production methods and products.

The scientific-technical and production activities of the combine in 1980 and in the near future are determined primarily by the requirements of the domestic and international market, and are in full accord with the current trends in the development of this undoubtedly most dynamic subsector of electronics. In this regard, the activities of the combine are shaped by certain chief directions:

1) The MOS integrated circuits: circuits of the 400 and 500 series; permanent memories (the 7000 series); working memories--static and dynamic (8000 series); circuits for telephone equipment (the 900 series); time meters (the 200 series); the 8-bit universal microprocessor system with large input and output capabilities and a memory capacity of 64 kilobits (the 600 series); logical circuits; circuits for electronic calculators, and so forth. In the next few years there are plans to begin production of dynamic, permanent and working memories with a capacity up to 16 and 64 kilobits;

2) Bipolar integrated circuits: the 1US709, 1US709S, 1U0741 and 1U0741S operational amplifiers; 1SA710, 1SA710S voltage comparators; the 1U0101, 1U0201, 1U0101A, 1U0201A and 1U0301A operational amplifiers; interface circuits; voltage stabilizers, and so forth;

3) Optical electronic devices: light diodes with an emitted wave length of 800-1,000 nm (3E1001); optical connected insulators or optrons (6N2112, 6N2001 and 6N2017); phototransistors (2F2101, 2F2102 and 2F2062);

4) Discrete semiconductor devices: silicon diodes with a voltage up to 1,200 volts and a current up to 25 A; silicon planar epitaxial transistors with a boundary frequency f_T to 300 MHz and a dispersed collector power from 8 to 60 W; medium- and high-powered high frequency transistors; UHF transistors; rectifier diodes; transistors to 15 A, and so forth;

5) Hybrid integrated equipment: a range of resistive groups; delay lines; entire hybrid electronic assemblies.

During the period of the Eighth Five-Year Plan, microelectronic elements will undergo very strong development and will have a direct influence on the cost of the products of the electronic equipment.

In parallel with this, the combine is developing ever closer ties with the countries of the socialist camp and primarily with the USSR. Particularly valuable and helpful has been the aid provided to us by specialists from the enterprises of the USSR Ministry of Electronics Industry.

For the collective of the combine the 15th anniversary of Bulgaria's semiconductor industry is not only a cherished holiday, but also the proper grounds for reflecting and assessing our place and our responsibility for the accelerated development of Bulgarian microelectronics. More than 80 enterprises in our country and abroad each year state their high requirements for us. Our product is the basis for such important subsectors as computer and office equipment, automation and instrument building, radio and television equipment and others related to the introduction of electronics in the national economy and social life. And as was emphasized by

Comrade Todor Zhivkov in his speech at the opening of the Semiconductor Instruments Plant on 24 April 1984: "...At present it is inconceivable to have technical progress which is an area of both material production and human life, without ever widely employing the capabilities of radioelectronics and cybernetics.... Electronics and cybernetics under the conditions of communism make human labor more creative and highly productive, they provide an opportunity to organically combine mental and physical labor...."

All of this sets out the development path for the sphere and poses major and responsible tasks for its collectives.

10272
CSO: 2202

SPECIFICATIONS OF NEW INTEGRATED CIRCUIT FOR TOUCH PHONE

Sofia RADIO TELEVIZIYA ELEKTRONIKA in Bulgarian No 6, 1989 back cover

[Advertisement for the [illegible] Integrated Circuit for the Touch Telephone]

[Text] The [illegible] integrated circuit performs all logical functions for converting the action of the keyboard into standard pulse series. There is the possibility of changing the pulse frequency, the pulse ratio and the interseries pause. The circuit provides for the repeating of the last dialed number. It is installed in a 16-terminal DIP [illegible] plastic housing.

Basic parameters

Memory capacity	20 digits
Pulse frequency	10, 20 pulse per second
Pulse ratio	[illegible]
Interseries pause	[illegible] ms
Operating frequency	[illegible] kHz
Power voltage	[illegible] V
Consumed power	[illegible] mW

Producer: [illegible] Scientific Production Economic Combine for Semiconductor Equipment

Exporter: [illegible]

BRIEFS

NEW NATURAL GAS STORAGE--The Brno Research Institute for Geological Engineering will convert a depleted coal mine near Pribor, North Moravia, into a natural gas storage. The gas will come from the natural gas deposits in South Moravia. The first stage of construction will enable storage of 180 mill .n cubic meters of natural gas in the mine, of which 2 million will be delivered daily to consumers. Recently work began on another similar project located in Hrusky, Breclav District. [Bratislava PRACA in Slovak 18 Oct 80 p 9]

CSO: 2402

COUNTRY'S ROLE IN COMPUTER TRADE VIEWED

Budapest KULGAZDASAG in Hungarian No 8, 1980 pp 61-63

[Article by Nandor Balogh, engineer-economist, member of the Computer Service of the National Administration: "Hungary's Role in World Computer Trade"]

[Excerpt] Hungary is at the third of the six levels in the model system (CIDP index) arrived at by the UN and further developed by others to measure the state of computerization in individual countries. The starting point for the model is economic, technological, and cultural development and the interrelationship and mutual effects of the state of computerization. Accordingly, our computerization is essentially adequate but remains below the state of our development. In 1977, 521 general-purpose computers were installed in Hungary. This amounts to 0.07 percent of the general-purpose computers (CPU) in the world. In respect to the specific number of units (calculated by computers per million of population (47 units) Hungary is somewhat below the world average but above the average for socialist countries, and the same can be said of the percentage value of the installed machine pools as compared to the GNP. The Computer Technology Central Development Program introduced in Hungary in 1971 on the basis of the ESZR [Uniform Computer Technology System] raised--despite the existing problems--the level of our computerization within the above-named model system in the 1970's by at least one full level. Regarding a computer pool like this of relatively small total value, conclusions regarding foreign trade should be made only carefully since the acquisition of a large computer or two will substantially modify the ratios, particularly in an annual breakdown. Twenty-three percent of our general-purpose computers are of Hungarian manufacture, 38 percent socialist, and likewise 38 percent capitalist. Fifty-eight percent of our mini-microcomputers are of Hungarian manufacture, 14 percent socialist, and 31 percent capitalist. General-purpose computers of Hungarian origin are the small computers manufactured on the basis of capitalist license by VIDEOTON and KFKI [Central Research Institute of Physics], while those of capitalist origin are in general medium and high performance computers. Our largest manufacturer makes small computers in accordance with VIDEOTON and ESZR specialization. Electronic Data Processing (VT Computer Technology Factory) receipts are still below other receipts (for radio and [illegible] but the ratio increased dynamically in the 1970's. The bulk of EDP receipts derive from exports; its largest commercial and service branches are in the Soviet Union and GDR, but its activities are also being increased in the FRG, where it markets through a mixed enterprise. It has longstanding ties with France deriving from license purchases. In the near future it would like

to reorganise its information system into a computerized network. The bulk of socialist imports come from the Soviet Union and the GDR; in the case of capitalist imports the country of origin is less important than the manufacturer because in principle the large firms can sell the same product from a number of countries. Here our main suppliers are IBM, Siemens, CII-HB and ICL, although the role of Japan is also increasing in our computer technology. It should be noted that before granting an import license--unlike with the purchase of other commodities--the coordination of local and national economic interests is carried out by the Computer Technology Application Committees or the Computer Technology Interministerial Committee (for example, from the viewpoint of software compatibility and applicability in teledata processing systems). The custom duties for computer technology equipment in capitalist trade is uniformly 20 percent.

Table. Foreign Trade Direction of Hungarian Computer Technology Products (SITC 75) in the Second Half of the 1970's
(in million forints)

Countries (regions)	Imports			Exports		
	1976	1977	1978	1976	1977	1978
Socialist countries	1859.6	2265.7	2402.7	3101.5	3619.2	3942.0
CEMA	1856.0	2262.8	2399.3	3039.7	3555.3	3843.3
Nonsocialist countries						
Developed capitalist	1068.4	1591.4	1958.6	184.5	193.0	401.7
European Economic Community	505.5	836.9	1090.0	71.1	50.0	153.0
Other European	319.6	394.3	311.1	113.3	136.0	219.5
Outside of Europe	243.3	360.2	584.6	0.2	7.0	29.1
Developing countries	16.9	10.9	0.1	3.3	13.2	10.2
Total*	2944.8	3868.0	4388.4	3289.3	3825.4	4353.9

* In million dollars: 66.6; 94.5; 115.2; 74.4; 93.5; 114.3
Source: Foreign Trade Statistical Yearbook 1978

Our foreign trade in computers increased dynamically in the first half of the 1970's. Our imports grew annually on an average of 63 percent (imports had a decisive role in the increase in specific indexes); in 1976 it declined somewhat, but even so it represented 0.74 percent of world import, which is one magnitude greater than our weight in computer stock. Thus Hungary is joining intensively in international work specialization; our balance was negative in the first half of the 1970's, but then it became evened out.

Both exports and imports increased significantly, the latter, however, by no means as in previous years but at a declining rate; with exports this trend was milder in extent. In trade with socialist countries our balance is strongly positive while in trade with the developed capitalist countries it is even more strongly negative, and in case of the latter our commodity structure is also more unfavorable. The bulk of our socialist exports went primarily to the ESZR member countries, the Soviet Union and the CSSR. At the same time the importance of the EEC countries (the FRG and France) also increased, and this can also be observed in our trade with the other developed capitalist countries (Switzerland

and Sweden). In our imports, the socialist countries (Soviet Union and GDR) had the major role, although their ratio fell from 63 to 55 percent. The ratio of our EEC imports (from the FRG, France and Great Britain) on the other hand increased from 17 to 25 percent, while from other European countries (Sweden, Switzerland, Austria) imports declined from 11 to 7 percent. Our imports from developed capitalist countries outside of Europe (Japan and the United States) rose from 8 to 13 percent, while they declined from the developing countries (India, Hong Kong).

In respect to our commodity structure, the small (though growing) ratio of peripheral products is striking. The ratio of the large, general-purpose data processing computers was 53 to 63 percent, of small computers 2 to 7 percent, while of peripheral products it rose from 13 to 24 percent. In our exports the ratio of calculators is between 3.5 to 6.2 percent, of small computers between 78 to 87 percent, while the ratio of peripheral products fluctuated between 10 to 16 percent. In the case of calculators, our balance is negative, but in accordance with our specialization it is strongly active for small computers (we have only imports in the large computers since we do not manufacture these domestically), and in the case of peripheral products it is even.

With the second half of the 1970's the growth rate of specific indexes of our computerization declined somewhat, primarily as a result of a moderation in imports. Nowadays the emphasis in Hungary too--as in the developed capitalist countries--is shifting in the direction of teledata processing. A more vigorous development of such systems is also for us the course to be followed (but in harmony with our possibilities) because among other things it makes possible a more effective utilization of existing computers. The realization of a macro-level concept serving this goal and prepared with the participation of all the interested parties (computer technology and telecommunications manufacturers, appliers, and researchers) will make its influence felt in the 1980's in our information systems. Our teledata processing systems which are under development are for now being built mostly on capitalist computers (the applicability of the small computers which we manufacture is in part solved and in part underway), but it can be expected that soon the large ESZR computers will appear in or expand further our teledata processing systems.

6691
CSO: 2502

MEMORY OF ES 1022 COMPUTERS EXPANDED

Budapest SZAMITASTECHNIKA in Hungarian No 9, Sep 80 p 1

[Text] Over 100 imported Ryad computers were in operation in Hungary in 1979. Most of these, over 40 percent of ES imports, consisted of ES 1022 systems. The efficiency of these systems is proved by the favorable experiences of those who operate them. However, the scope of tasks to be processed has been increasing steadily, and sooner or later those using the ES 1022 encounter limits in the resources available to them through the system. Purchase of larger computers will be restricted to cases of dire necessity because of the limited investment possibilities provided by the Sixth Five-Year Plan. Therefore the recommended procedure is to expand the capacity of the ES 1022 computer and to improve its efficiency.

One way of doing this is through use of an up-to-date operating system (OS). A basic condition for use the OS system is an operational memory of at least 512 Kbytes. However, very few ES 1022 configurations have a storage capacity of this size.

After recognizing the problem - and to increase the reliability of the memory - the Technical Department of NIM IGUSZI [Ministry of Heavy Industry Institute of Industrial Economics and Systems Analysis] developed a semiconducter memory which is fully compatible with the ES 3222 ferrite memory. Furthermore, by exchanging some printed circuit boards, they made it possible for the CPU of the ES 1022 to handle a 1Mbyte memory so that the configuration can be expanded to 1Mbytes through 256 Kbyte increments.

The LABOR Instrument Industry Works is already producing the semiconductor memory and the first models will be put on the market by the National Computer Technology Enterprise in the course of this year.

CSO: 2502

POTENTIAL OF TECHNICAL INTELLECTUALS UNREALIZED, UNREWARDED

Budapest NEPSZABADSAG in Hungarian 7 Oct 80 p 3

[Interview with Dr Janos Toth, first secretary of the Federation of Technical and Scientific Associations, by Mihaly Tamas. Date and place not given]

[Text] The Federation of Technical and Scientific Associations [MTESZ] has 170,000 members. It joins the intelligentsia into thirty-two associations, which encompass all areas from mining to construction industry, and from communications to mathematics. We had a discussion with Dr Janos Toth, the federation's first secretary on the conditions and goals of the technical and agrotechnical intelligentsia.

Only a Fragment

[Question] In your view, what is the significance and role of the association? And with what problems have the members of the MTESZ concerned themselves lately?

[Answer] Last year a million and a half experts participated in the 28,000 events sponsored by the associations. Among others, we discussed questions such as the economical utilization of energy and of raw materials, the problems of our electronics industry, the situation of the pharmaceutical industry, and the development of the industrial base of agriculture. Many debates have taken place--and are still continuing--on these questions. These meetings have resulted in many useful ideas, observations and propositions. The greatest significance of the MTESZ lies in the fact that it unifies and brings together to a single table the authorities of the most diverse fields. By stepping across the boundaries of the fields of specialization, of bureaucratic offices, and of county borders, it is able to bring together all of those who may be in need of cooperation while involved in the examination of various diverse and complex questions. On these occasions an employed engineer sits together with the appropriate deputy minister, the mechanical engineer with the biologist, the researcher with the administrator, the producer with the consumer, and they discuss the common problems as colleagues, irrespective of their offices or places of employment.

[Question] In your estimation, how fully are the proposals that reflect the technical intelligentsia's know-how and its willingness to help being utilized?

[Answer] It is a tradition reaching back several decades that the state organs present their plans and their concepts for technical development to various MTESZ platforms for evaluation. The party committees of the counties and the cities are

well aware how important it is to base their decisions on the assessments of the members of the federation. On the county level the MTESZ is built organically into public life. In actuality it fulfills the role of a broadly-based, voluntary consulting agency. Regional developmental plans were all born with the help of these associations, and it was through their cooperation that a multitude of local projects for transportation, water management and settlement planning came into being.

Such cooperation has also developed among the ministries and various other central agencies and associations. At the moment we are in the process of establishing such close relationships also with the leading agencies of our capital city. We are establishing the Budapest executive committee of the MTESZ. We intend to enhance through this measure the solution of the complex construction, communications and other infrastructural problems that are inseparably connected with the development of the capital.

In answering your question, however, I still have to acknowledge that for the time being we are able to utilize only a fraction of the know-how of our technical intelligentsia even with the MTESZ. We definitely intend to change and to improve the situation. We are hoping that in preparing, bringing to conclusion, and in executing a particular resolution, the party and the state organs will request the opinions of the associations' experts in time, i.e., prior to having made the final decision. It is an encouraging sign that in the past few weeks the MTESZ's presidium has been approached on several questions of national significance by the various sections of our party's Central Committee, by the Council of Ministers, as well as by the other specialized ministries. In this way we were given a chance to make our views known concerning the Sixth Five-Year Plan, and in particular its scientific and technical aspects. We were asked to comment on the further development of the existing network of research institutions. The ministry of heavy industry has approached the MTESZ for its views concerning the economical use of domestic raw materials. Our technical experts always satisfy these demands. They reveal their views honestly and without any attempt to conceal anything. On this level their views are not being influenced by existential considerations.

It Has Lost Its Attraction

[Question] Most of the engineers, plant managers and young technicians whom I have encountered in the factories and in research institutes in the course of the past few years have complained about the alleged decline of the significance and importance of technical developments. Do you agree with this assessment?

[Answer] The 12th party congress has clearly emphasized the significance of technology and the sciences, and the role of the technical and agricultural intelligentsia, as well as the need to draw this intelligentsia into our public life. This attitude was greeted with great joy by our technical intelligentsia. Now it is expecting to see a new epoch, in the course of which technological developments will again occupy a worthy place in our public sentiment and in the eyes of our bureaucracy.

Many believe that in the course of the past decade the significance attached to technology and the sciences in Hungary has declined. There are those who believe that this phenomenon is the result of these fields having been pushed into the background by short-range financial considerations. Sadly enough, this is true even

for today, notwithstanding the clear directives of the party congress. Our experts are of the opinion that we will not be able to conquer our economic problems, unless we utilize to a much greater degree our existing intellectual resources.

Let me note here that the technical intelligentsia has a great deal of respect for our financial and economic experts, and it recognizes the importance of their work. But it is a rather universal wish among them that, in this stage of our development, they should also strive first of all to establish even better conditions for the raising of the level of our technology than hitherto, and to do so on the basis of long-range plans. In my estimation, this is one of the key questions of our whole future.

[Question] Recently much has been said in various meetings about the general condition and disposition of the technical intelligentsia. What are your views on this question?

[Answer] Many people are raising very thoughtful questions from various directions. They appear to see contradictions between words and deeds. In the wake of the party congress many of us have raised the question that the development of an up-to-date product composition and competitiveness on the world markets presumes the speeding up of our technological developments, both on a short-range and a long-range basis. The technical fields have lost much of their former attraction in the eyes of the young. We can also detect feelings of uncertainty and dispiritedness among many of our engineers. They claim that they encounter too many superfluous bureaucratic obstacles. They do not really feel, so they claim, the moral and material support of society.

I am sorry to say that more recently we are often confronted with situations when gifted children of workers' families are increasingly reluctant to subject themselves to the hardships of five years of study at a technical university. When we search for the causes of this phenomenon then we find that in the course of the past ten years the pay scale of the technical experts, as compared to that of the workers, has worsened considerably. Nowadays the salary of employed engineers is hardly better than that of trained workers, and at times it is even less. And if we add to this the fact that engineers are at a disadvantage even in the allocation of apartments and places in kindergartens and nurseries, than we cannot be surprised at this lack of enthusiasm.

From Proposals to Realization

[Question] If the know-how and the ability of the technical intelligentsia remains unutilized, then this group will undoubtedly break a path for itself in areas that are much less essential for society as a whole. I believe that this harmful process has also been noted with the federation.

[Answer] Many have voiced the view that a portion of the well-trained experts are not giving their best at their places of employment. This is true even though society's best interest would demand that these employed and trained experts should give their best and should secure respect for themselves at their places of employment, and not elsewhere. I am sorry to say that in this respect not everything is well with us.

There is another thing that has to be mentioned in this connection. Many feel that they have to perform in low level jobs that are not commensurate with their education. Moreover, on top of all this, they don't even have the opportunity for self-improvement. In my estimation, this is the result of an unhealthy division of labor among the various categories of technical experts, such as technicians, the production engineers and the graduate engineers; primarily because there is a shortage of technicians. About a decade ago the training of technicians had been stopped on the basis of considerations that since were proven to be wrong. For years we were unwilling to recognize this phenomenon, and perhaps some of us are still unwilling to do so. This has created problems that may not be rectified for many years to come. The above remarks may constitute a detour, but they do relate closely to our topic.

[Question] Returning to the activities of the MTESZ, what are your plans, what changes do you envisage in order to make your work more successful in the future?

[Answer] It is self-evident that we will have to gear our work to national goals, i.e. to the directives of the party congress and to those of the new five-year plan. At the present, in light of the congressional resolution, our experts are working on the execution of five significant coordinated goals. We can already show some results. Let me just mention, for example, our work on energy management, or on the utilization of our intellectual resources.

We have always transmitted all of the worthy proposals made at the MTESZ forums, as well as all the studies elaborated in the committees to the appropriate governmental agencies and to other institutions that may have been interested in their use. Our greatest current problem is to prevent the many technical-scientific ideas that have been worked out by our experts from remaining simply ideas. It is for this reason that we have decided that in the future we will not be satisfied by the simple transmitting of ideas. We will follow their paths right up to the point of their realization, and we will cooperate in removing all obstacles from their paths. In this connection we will also follow carefully the activities and progress of our associations' younger members.

I am convinced and I hope that in the wake of the current association and county meetings, and especially after the election of new officers at the next year's MTESZ Congress, the active participation of young experts in the leadership and in the working committees will increase. The above, of course, constitutes only a small fraction of the ideas and problems that occupy the thinking of the current leadership of the MTESZ. What we regard as our most essential task is to bring to the surface the already existing, but as yet unutilized intellectual resources. There was never a greater need for this than under the current economic conditions--the first secretary concluded his remarks.

9271
CSO: 2502

BRIEFS

PEST CONTROL RESEARCH--The Plant Protection Research Institute has experimented with sterilization of pests as a control measure. Their effort was concentrated on the codling moth as a subject. According to Dr Laszlo Varjas, synthetic substances which affect insect hormones and resemble the juvenile hormone have been developed. These substances produce physiological disturbances in insects so that they become unviable. Although several thousand such hormone analogues have been synthesized, their widespread use is hampered because of the costs involved. In Hungary work of this nature has been done at the Technical University and the Central Chemical Research Institute. The United Pharmaceutical and Nutriment Factory is working on a similar hormone analogue. Another way of combating insect pests is by extracting substances which deactivate hormones from plants. The Plant Protection Research Institute is conducting preliminary tests with such "antihormones" on the boll weevil. [Budapest MAGYAR HIRLAP in Hungarian 12 Oct 80 p 11]

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OPERATION, CHARACTERISTICS OF THE ES 1032

Budapest SZAMITASTECHNIKA in Hungarian Jul-Aug 80 p 13

[Text] The ES 1032 computer system has been imported from the MERA-ELWRO factory of Wroclaw since 1975. The central unit, the entire remote data processing subsystem, the tape storages and the slow periferials are being manufactured by the Polish computer industry.

Regarding the realization of operative memory, it is a ferrite storage made by planar technology, having a 1200 ns time cycle and a 500 ns access time. Regarding its organization, it is a 3D-type storage with Byte organization. During a storage cycle, it is accessible in a span of 4 Bytes. Every Byte contains an independent parity bit.

The modular construction guarantees a fast localization of malfunction as well as great flexibility. A single memory module has a capacity of 128 Bytes. A maximum of 8 modules may be turned on when the storage capacity is 1 MByte. The individual memory modules can be labelled separately, and consist of 8 16-KByte changeable cards.

Labelling of the informational Bytes is done with a 24-Byte label register which can accommodate labelling up to 16 MBytes although the maximum practical storage capacity is 1 MByte.

The processor implements the instructions in the order of storage. It works together with the operative storage, does arithmetical and logical operations, and initiates data transfer in the channels. It uses 16 (4 Bytes wide) general registers for the temporary storage of fixed, logical and indexed operations, and 4 (8 Bytes wide) floating registers for the temporary storage of floating operations.

The processor's logical architecture and breaker system is compatible with the principles employed in the IBM 360 series. With regard to its principles of operation and control, it is similar to the IBM 360/50 model. The characteristics of the control system are: logic with microprogrammed control; hardware control in the operative storage; microprogrammed and hardware control during the joint operation of the processor and the channels. We measured the processor's operational speed with a program independent from the system which is suitable for the examination of the central unit of both the ESR and the IBM 360/370 machines.

The program examines, with one of the IBM software products and reviews how are built into the given control unit and what their operations spend on. From these data, it calculates the averages according to the blocks sizes as well as the so-called Commercial Mix. A few comparative data are shown in the table below.

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

The reviewed volume indicate the average operations spend [illegible] according to the following rules:

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]

Note that the comparative data of the table above plus with the internal characteristics of the processors and are less characteristic of the running speed of one or another concrete program. Due this is greatly affected by the processing peculiarities of the given operations system and by the system's other characteristics such as, for example, the use of the background, input and output operations etc.

The input-output system takes the connection between the processor or memory and the other elements of the system. Communication between the peripheral control and the channels is done through the I/O connection.

The channels are connected between the processor [illegible] the operation storage and the peripheral control. The system has two types of channels: the multiplex (MPX) and the selector (SEL).

The SEL channel has a single subchannel while the MPX channel may have 128 or 256 subchannels. The MPX channel can operate both as a selector and a multiplexor. In the selector method, data transfer is done in groups while a peripheral occupies the channel during the time of transfer. The SEL channel can operate only as a selector. Three selector channels have been built. A single channel's transfer speed is 1.2 Mbytes per second while channel transfer speed is 1.7 Mbytes per second. In the multiplex method, several subchannels operate simultaneously in the MPX channel. The data-byte collected from one of the peripherals is stored by the subchannel which is then pure it to the appropriate place of the operation storage to the given time. The I/O interface among the simultaneously operating peripherals connected to the appropriate subchannels, is a time-sharing one. The peripherals operating in the MPX channel can also operate in the selector method into so-called [illegible] burst method. Transfer speed: 133,000 bytes per second in the multiplex method, and 470,000 bytes per second in the burst method.

[illegible]
[illegible]

[illegible] the [illegible] 600 universal minicomputer is an original Intech equipment unit of [illegible] and modular construction. The operating storage can be expanded from a capacity of 64 Kbytes to 1 Mbytes through a simple connection of the memory modules on the main bus. It has a powering breaker system, a real-time clock and an automatic restarting power circuit in case of power failure. It can operate in a non-processor operation with a main memory.

Two communication systems are the [illegible]-1 in multiprogrammed operation, and the [illegible]-1 in monoprocessing operation. The [illegible] 600 is suitable for scientific and engineering calculations and for real-time data processing applications. On the hardware side, the [illegible] 600 is also equipped by a real-time channel which connects the machine with the process.

The main peripherals connected to the [illegible] 600 are as follows. 80 Mbit (10 Mbyte) magnetic disk unit, 80-200 cps (80 cps) half-duplex magnetic tape unit, 80-1 (80 cps) full-duplex magnetic cassette unit, 80-1-80 (80 cps) paper tape, 600-101 (80 cps) [illegible] punch, 80-1 (80 cps) line printer, [illegible] 7600 (80 cps) display, and 600-1 (80 kbit) punch card station.

The [illegible] 600 is manufactured by the Scientific and Manufacturing Center for Information and Measuring Technology of Taiwan. It makes 100 or 500 systems annually.

The [illegible] 600 is a general-purpose, 16-byte minicomputer. As a result of its modular architecture, the system can be easily expanded. The great reliability is guaranteed by several integrated circuits. The fabricated units are easy to service and do not require any maintenance. Technical service is made effective by appropriate testing equipment and a wide array of testing and diagnostic programs. The multiprocessing and multiprogramming operational system, the high-level programming language [illegible], batch supported by an extensive program library, and a reliable hardware make it a unique system, economical and effective tool for the user. The system consists of modules which communicate with one another exclusively through a standard interface. This is advantageous in many ways than the connection of various modules (e.g., rapid storage units and microprocessors) is possible.

The system's central hardware configuration consists of the following:

-4 processors, 17 operating storage modules, and 16 input/output channels.

At present, three kinds of channels are available:

--a programmed channel which makes it possible to connect a maximum of 8 peripherals (these can operate in a start/stop or in a synchronized way by a slow transfer speed);
a direct (storage-accessible) channel which makes it possible to connect 2 magnetic discs and 3 magnetic tape units; and the automatic equipment that regulates industrial objects.

The channels may be connected to the operative unit in any combination. One operative storage module has a capacity of 32 Kilo-word (the word length is 16 bytes). The storage modules' time of accessibility is 400 to 600 nanoseconds. The basic storage module is divided in a software way into a system block and a user's block which are accessible only through the software.

The specifications of the MERA 400 system's central unit are:

--16-byte word length; direct labelling: 32 Kilo-words, i.e., 64 Kbytes; 8-16-byte general registers, of which 7 are accumulating or index registers; maskable, 11-level breaker register, with an automatic feeding of the hardware organization of the breakings and the specifications of the breaking.

--real-time clock: automatic program-filling and network-protecting circuit and automatic re-start of the programs; a set of commands consisting of 132 commands; three kinds of command modification.

The processing unit may be installed by a multi-precision hardware operative element which makes it possible to implement special commands; with the help of these, the four basic operations and the normalization of numbers of double word-length or of fixed and floating long numbers can be carried out.

The real-time clock makes real-time operation possible by generating a program interruption in one of the following time intervals: 2 milliseconds, 10 milliseconds, 20 milliseconds, 40 milliseconds and 80 milliseconds.

The MERA 400 has a wide selection of peripherals; these are as follows:

--CT-2100 punch card reader, PT-1055 tape puncher, DZM 180 matrix presser, KSR-DZM-180 matrix presser with a keyboard, MERA 7952 display, MERA 7905 group control, MERA 9425 magnetic disc unit (capacity: 5 MBytes), PT 305 magnetic tape unit, PK 1 magnetic cassette units (operates with two cassettes), SP 45 DE floppy disk units (with a capacity of 270 Kbytes for each disc; operates with four discs), DW 3 line presser (160-column line presser; pressing speed: 110 lines per second).

The MERA 7905 group control is especially noteworthy which makes possible the on-line operation of 8 special displays and 2 DZM 180 matrix pressers with keyboards through a single input/output of the programmed channel. The display units can be connected with the group control by a maximum 600-meter long coaxinal cable.

The DZM 180 keyboard matrix pressers and the MERA 7905 group control can also be operated far away from the computer through the V 24 interface and by interposing MODEM's and telephone lines.

The MERA 400 system is delivered together with the SOM 3 multitask operational system.

The operational system helps in developing supervisory systems and in using the system's resources economically. It makes it possible to deal with complex software problems--especially with real-time problems--and to organize large computing centers. The system is equipped with an extensive program library which aids the development of user's systems and programs.

The library contains, among other things, the following: FORTRAN IV, together with the real-time extensions; interactive, multi-console BASIC; macroassembler; sequential and directly accessible file-operating processors; link editor, which connects the object-program modules and makes possible the development of the overlay structure; cataloger, which makes possible the development of the dictionary files of the object-program modules; sequential library update; source update, for processing files in the original language; and debugger (track-following program), for the aid of shooting programs.

Perspectives of Developing the MERA 400

The MERA 400 system will be equipped in the future with 30-Mbyte magnetic disc units, DIGIGRAF-type plotters, a graphic display and a channel that works together with the IEC interface. In the area of software, i.e., data processing, control, technical/scientific calculations, service for clinics, hospitals and analytic and diagnostic laboratories, and industrial process control, which requires a constantly increasing program package, the introduction of the following has been planned in addition and within the basic software framework:

--operational systems: SOM 5, for local and long-distance conversation; SOM 7, suitable for parallel processing on the basis of the LOGLAN "simultaneous" programming language (an original program language developed in Poland).

--translators: COBOL, SIMULA 67.

The MERA 400 is suitable for solving the following problems in problem-oriented configurations:

--complex technical/scientific calculations, with the possibility of simulation and optimalization of the solutions and under the conditions of operations in conversation and long-range accessibility of the large data bases; control of uninterrupted and discrete production processes at the level of the manufacturing sectors, through the use of CAMAC connectors or channels; service for clinics and hospital wards and larger analytic and diagnostic laboratories and management and administration data processing; real-time processing; remote-batch processing; and data collection and distribution.

The MERA 400 systems may be connected at will to large computers (e.g., to machines of the ESR series) as intelligent terminals on the lines of data transfer. The other way around, numerous periferials can be connected to the MERA 400 through telephone lines as long-distance data end stations (DZM 180 matrix pressers with keyboard, MERA 7952 displays and MERA 7905 group controls with displays and pressers).

If we also consider the added possibility of connecting, similarly to the above, i.e., through telephone lines, the Polish-made 8-byte MERA 100 and MERA 200 minicomputers as well--the function of which is data collection and processing--then it becomes evident that wide computer networks may be built in the various areas of the national economy.

The MERA 400 systems have been mass produced in the last years, and there are about 250 computers in operation at present. According to the plans for this and the coming years, annual production will reach at least 200 units.

The systems already working are employed in the following branches:

--in corporations and enterprises, for management, production planning, material and expense accounting, economic analyses etc.;

--in construction planning offices, for making construction plans automatically on the basis of construction type element catalogs, and for statical, qualitative and quantitative calculations;

--in industrial planning offices, for engineering calculations; for operating the data banks of the new development projects; in laboratories of research institutions and institutions of higher education, for collection and analysis of research data; in medical science, in the course of servicing the laboratories of hospitals and clinics, for collection and analysis of laboratory results in the intensive-care units and in sugar factories and large power plants, for regulation of industrial processes.

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Debbie